

SM3-A HW #5-4 (modeling with rational functions)

Period _____

Simplify each expression.

1) $\frac{2n}{12m^2} - \frac{6m + 4n}{12m^2}$

2) $\frac{4}{2} - \frac{3n - 2}{2n - 5}$

3) $\frac{a^2 + 9a + 20}{a - 4} \cdot \frac{a - 4}{6a^2 + 30a}$

4) $\frac{(n + 4)(n - 1)}{8n^2} \div \frac{(n + 4)(n - 1)}{8n^2(n + 4)}$

Identify the domain and range of each.

5) $y = -\frac{3}{4}\sqrt{x + 3} + 5$

Find all zeros of the "quadratic form" equation below

6) $f(x) = x^4 - 5x^2 - 14$

- 7) a) Rewrite as a Reciprocal function
b) Identify the "excluded values of x" (which are x-values NOT in the domain)
c) Identify the vertical asymptote of the graph.
d) Identify the x-intercept.
e) identify the horizontal asymptote
f) Identify the y-intercept.

$$f(x) = \frac{3x + 1}{x + 3}$$

- 8) How many lbs. of mixed nuts that contain 60% peanuts must Kayla add to 12 lbs. of mixed nuts that contain 75% peanuts to make a mixture with 66% peanuts?
- 9) Mofor wants to make a 72% alcohol solution. He has already poured 12 L of a 90% alcohol solution into a beaker. How many L of a 45% alcohol solution must he add to this to create the desired mixture?
- 10) For her birthday party Molly mixed together 9 gal. of Brand A fruit punch and 3 gal. of Brand B. Brand A contains 56% fruit juice and Brand B contains 32% fruit juice. What percent of the mixture is fruit juice?

Solve each question. Round your answer to the nearest hundredth.

11) It takes Sumalee 12 minutes to sweep a porch. Jack can sweep the same porch in 14 minutes. If they worked together how long would it take them?

12) Working alone, Mofor can mop a warehouse in 11 hours. One day his friend Heather helped him and it only took 4.63 hours. Find how long it would take Heather to do it alone.

13) Working together, Mike and Daniel can pick forty bushels of apples in 7.24 hours. Had he done it alone it would have taken Daniel 15 hours. How long would it take Mike to do it alone?

Solve each equation. Remember to check for extraneous solutions.

14) $\frac{1}{a^2} - \frac{3}{a} = \frac{4}{a^2}$

15) $\frac{a^2 + 4a - 12}{a^2 - a} = \frac{4}{a - 1} + 1$